CLAIMS

1. An electricity storage device, comprising a polymer electrolyte and polarizable electrodes,
the polarizable electrodes each comprising an interface with the polymer electrolyte,
the polarizable electrodes being metal electrodes,
a negative electrode of the polarizable electrodes having, at its interface with the polymer electrolyte, a lithium alloy with a metal component contained in the negative electrode,
the lithium alloy being capable of releasing lithium ions through a reversible electrochemical oxidation-reduction reaction.

2. The electricity storage device according to claim 1, wherein the metal electrode as the negative electrode is a metal electrode whose components include one or more metals selected from the group consisting of gold, lead, tin and zinc.

3. The electricity storage device according to claim 1, wherein the metal electrode as the negative electrode is a gold electrode.

4. The electricity storage device according to claim 1, wherein a positive electrode is composed of the same metal elements as the metal components of the metal electrode as the negative electrode.

5. The electricity storage device according to claim 1, wherein the lithium alloy is a lithium alloy which occurs by application of minus voltage to the metal electrode in a non-aqueous solution containing lithium ions.

6. The electricity storage device according to claim 1, wherein the polymer electrolyte is an ion exchange resin.

7. The electricity storage device according to claim 1, wherein the electricity storage device is an electrode assembly.

8. The electricity storage device according to claim 1, wherein a specific capacity of the electricity storage device is not less than $20F/cm^3$.

9. A method for producing an electricity storage device, comprising:
a structure forming step of obtaining an electrode-electrolyte structure where each of the polarizable electrodes is formed on a polymer electrolyte through an electroless plating method; and
a layer forming step of applying voltage to the polarizable electrode while the electrode-electrolyte structure obtained by the structure forming step includes a solution containing lithium ions, to form a layer containing lithium and a metal component of the polarizable electrodes at the negative electrode of the polarizable electrodes.

10. The method for producing an electricity storage device according to claim 9, wherein the solution containing lithium ions is contained into the polymer electrolyte of the electrode-electrolyte structure as a pre-step of the structure forming step, or concurrently with the layer forming step.

11. The method for producing an electricity storage device according to claim 9, wherein

the polymer electrolyte is an ion exchange resin membrane, and the electroless plating method is a method including: an adsorbing step of making the ion exchange resin adsorb a metal complex; and a reducing step of bringing a reductant solution into contact with the ion exchange resin, to which the metal complex was adsorbed by the adsorbing step, to deposit a metal.

12. The method for producing an electricity storage device according to claim 9, wherein the metal complex contains one or more metals selected from the group consisting of gold, lead, tin and zinc.

13. An electricity storage device, comprising a polymer electrolyte and polarizable electrodes, and obtained by forming an electrode-electrolyte structure where each of the polarizable electrodes is formed on a polymer electrolyte through an electroless plating method; and
then applying voltage to the polarizable electrodes while the electrode-electrolyte structure includes a solution containing lithium ions, to form a layer with a metal component of the polarizable electrodes bonded to lithium, at the negative electrode of the polarizable electrodes.

14. The electricity storage device according to claim 13, wherein
the polymer electrolyte is an ion exchange resin membrane, and the electroless plating method is a method including: an adsorbing step of making the ion exchange resin adsorb a metal complex; and a reducing step of bringing a reductant solution into contact with the ion exchange resin, to which the metal complex was adsorbed by the

adsorbing step, to deposit a metal.

15. The electricity storage device according to claim 13, wherein the metal component contains one or more metals selected from the group consisting of gold, lead, tin and zinc.